Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal

Section 1. General administrative information

Restore West Fork Little Bear Creek For Steelhead

Bonneville project number, if an ongoing project 9118

Business name of agency, institution or organization requesting funding
Palouse-Clearwater Environmental Institute

Business acronym (if appropriate) PCEI

Proposal contact person or principal investigator:

Name Thomas C. Lamar
Mailing Address PO Box 8596
City, ST Zip Moscow, ID 83843
Phone 208-882-1444
Fax 208-882-8029
Email address lamar@pcei.org

Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name
Terragraphics Environmental Engineering	121 S. Jackson	Moscow, ID 83843	Ian von Lindern
City of Troy	City Hall	Troy, ID 83871	Mayor Jon Blom

NPPC Program Measure Number(s) which this project addresses.
7.6, 7.8D.2

NMFS Biological Opinion Number(s) which this project addresses.

Other planning document references.
Preliminary Investigation Report, Potlatch River, USDA-SCS 1994

Subbasin.
Little Bear Creek, Headwaters to Potlatch River (HUC: 17060306)

Short description.
Restoring natural/wild steelhead/rainbow trout to the upper reaches of the West Fork of Little Bear Creek will be accomplished through the biophysical restoration of those reaches of the West Fork of Little Bear Creek that have been urbanized.

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish	X	Construction	X	Watershed
X	Resident fish		O & M		Biodiversity/genetics
X	Wildlife		Production		Population dynamics
	Oceans/estuaries		Research		Ecosystems
	Climate		Monitoring/eval.		Flow/survival
	Other		Resource mgmt		Fish disease
			Planning/admin.		Supplementation
			Enforcement	X	Wildlife habitat en-
			Acquisitions		hancement/restoration

Other keywords.

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Reduce width/depth ratio	a	Stream assessment
		b	Design stable cross section
		c	Model with HEC-2 hydraulic model to determine floodway

			impacts
2	Increase sinuosity	a	Stream assessment
		b	Design meander width
		c	Model with HEC-2 hydralic model to determine extent of flooding
3	Reestablish a riffle/pool spacing of one half a meander wavelength	a	Stream assessment
		b	Determine by meader wavelength
		c	Model with HEC-2 hydralic model to determine flood elevations
4	Reconnect the active channel with a constructed functional floodplain	a	Permitting
		b	Bidding
		c	Construction
5	Stabilize eroding streambanks with habitat improvement structures	a	Stream assessment
		b	Determine appropiate structures
		c	Install sturctures after earthmoving is complete
		d	Install erosion control products to help with herbaceous vegetation establishment
6	Reestablish native woody and herbaceous plant community	a	Stream assessment
		b	Determine native plant community
		c	Plant herbaceous plants immediately after earthmoving
		d	Plant woody plants the following spring

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	10/1998	3/1999	7.00%
2	10/1998	3/1999	7.00%
3	10/1998	3/1999	7.00%
4	3/1999	10/1999	60.00%
5	8/1999	11/1999	10.00%
6	9/1999	6/2000	9.00%

			TOTAL 100.00%

Schedule constraints.
Permitting

Completion date.
2003

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel	Coordination staff	$40,000
Fringe benefits		$8,000
Supplies, materials, non-expendable property	Geotextiles, Plants, Revetments	$100,000
Operations & maintenance		
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		
PIT tags	# of tags:	
Travel	Local Travel	$2,000
Indirect costs	%10	$47,000
Subcontracts	Engineering	$20,000
Other	Earthmoving, grading	$300,000
TOTAL		$517,000

Outyear costs

Outyear costs	FY2000	FY01	FY02	FY03
Total budget	$50,000	$20,000	$20,000	$10,000
O&M as % of total	50.00%	50.00%	50.00%	50.00%

Section 6. Abstract

Restoring natural/wild steelhead/rainbow trout to the upper reaches of the West Fork of Little Bear Creek will be accomplished through the biophysical restoration of those reaches of the West Fork of Little Bear Creek that have been urbanized.

This goal is in concert with the 1994 Fish and Wildlife Program and recommendations of the Columbia River Inter-Tribal Fish Commission (CRITFC) and the Columbia Basin Fish and Wildlife Authority (CBFWA) contained within the document.

Objectives include:
Restoring natural/wild steelhead/rainbow trout populations to upper reaches of the West Fork of Little Bear Creek; Restoring anadromous and resident fisheries habitat on the West Fork of Little Bear Creek through the City of Troy, ID.; Reducing width/depth ratio; Increasing sinuosity; Reestablish a riffle/pool spacing of one half a meander wavelength; Reconnect the active channel with a constructed functional floodplain; Stabilize eroding streambanks with habitat improvement structures; Reestablish native woody and herbaceous plant community.

Project scope includes design, engineering, and construction of a biophysical restoration. The design methodology used will adhere to Rosgen's River Restoration Principles (Rosgen, 1996)

Section 7. Project description

a. Technical and/or scientific background.

The West Fork of Little Bear Creek is a headwaters stream in the Potlatch River Basin that eventually drains into the Clearwater River. It is a typical stream in this basin in that it has been impacted by agricultural, ranching, logging and mining practices for years. What makes the West Fork of Little Bear Creek unique in the Potlatch River Basin is that it flows through the City of Troy, ID. There are less than a few miles of urbanized headwaters streams in the Potlatch River Basin, but these reaches have been more impacted than any other due their higher population densities and residential and commercial development in their floodplains.

The urbanized reach of the West Fork of Little Bear Creek shows many of the impacts associated with flood control efforts. The reach has been straightened, widened and deepened over time to increase conveyance at the expense of instream aquatic habitat and the out of stream riparian area. The stream channel has downcut due to hydrologic and hydraulic modifications resulting from the various land uses throughout the West Fork of Little Bear Creek drainage. Through incision the active stream channel has abandoned its functional floodplain. The result is that the bankful discharge is now contained within the existing channel.

A Fisheries Inventory of the Potlatch River Basin conducted by the Idaho Fish and Game in 1995 and 1996 (Schriever & Nelson, Unpublished Report) reiterates that "land use practices have altered the hydrologic cycle, stream composition and riparian habitat within the drainage." The impacts to anadromous and resident fish populations can be attributed to the following according to Idaho Fish and Game: 1) high peak spring flows; 2) low summer flows; 3) high summer water temperatures; 4) unstable stream channels; 5) increased bedload; 6) increased sedimentation; 7) increased cobble embeddedness; and 8) decreased stream habitat diversity. Small urbanized streams typically exhibit all of these characteristics and the West Fork of Little Bear Creek in Troy, ID is no exception.

The Nez Perce Tribe identified four major problems for anadromous fish in the Potlatch River Basin after conducting stream inventories of tributaries from 1982 to 1984 (Johnson, 1985). The problems are: 1) extreme flow, 2) high summer water temperatures; 3) lack of riparian habitat; and 4) high sediment loads. Again these problems are prevalent in urbanized reaches of headwaters streams in the Potlatch River Basin.

In 1994, the Latah Soil and Water Conservation District requested assistance from the Soil Conservation Service to develop "appropriate criteria for prioritizing subwatersheds in the Potlatch River Basin for implementation of a long term watershed treatment effort focused on the future management, enhancement, and restoration of anadromous and resident fisheries as well as the overall health of the watershed (USDA-SCS, LSWCD, 1994)." The Preliminary Investigation (PI) Report for the Potlatch River that resulted from this consensus planning approach was used to identify and develop a problem statement, list short term treatment options, and select appropriate subwatershed prioritization criteria for a long term planning and implementation effort.

The following problem statement was formulated during the Potlatch PI: Earth cover changes and subsequent land use and management within the Potlatch River Basin have affected the hydrological functional aspects of the basin resulting in detrimental effects to the instream and downstream designated beneficial uses. Short term treatment strategies consisted of gathering more data and identifying funding sources for projects. Criteria were selected for a subwatershed prioritization process and a draft plan of work was developed for a technical team to begin data collection that would allow for future ranking of watersheds. As of this writing the subwatersheds have still not been prioritized by the Latah Soil and Water Conservation District.

The Potlatch River Basin Fisheries Inventory conducted by Idaho Fish and Game is partial fulfillment of the Potlatch River Primary Investigation Plan of Work. It has the most current fisheries information for the entire basin and is the primary document used to determine that the West Fork of Little Bear Creek has the most potential in terms of resident and anadromous fisheries habitat restoration.

b. Proposal objectives.

1) Restore natural/wild steelhead/rainbow trout populations to upper reaches of the West Fork of Little Bear Creek

2) Restore anadromous and resident fisheries habitat on the West Fork of Little Bear Creek through the City of Troy, ID.

3) Reduce width/depth ratio.

4) Increase sinuosity.

5) Reestablish a riffle/pool spacing of one half a meander wavelength.

6) Reconnect the active channel with a constructed functional floodplain.

7) Stabilize eroding streambanks with habitat improvement structures.

8) Reestablish native woody and herbaceous plant community.

c. Rationale and significance to Regional Programs.

According to population expansions calculated by Schriever and Nelson (Unpublished Report), the entire Bear Creek drainage supports the highest number of natural/wild steelhead/rainbow trout in the Potlatch River Basin. The West Fork of Little Bear Creek had the third highest population density of natural/wild steelhead/rainbow trout in the entire Potlatch River Basin with a density of 2.13 fish/100m^2. However, if we look at just the first 11.4 kilometers of stream up to the City of Troy, we find that the density goes up to 2.56 fish/100m^2. If we look at the last 4.8 kilometers of stream that were surveyed by Fish and Game through and upstream of the City of Troy, the density of natural/wild steelhead/rainbow trout is 0 fish/100m^2.

This significant population drop may be the result of the poor habitat conditions associated with channelization that has occurred within the City of Troy and land use practices upstream. If habitat along with geomorphic channel characteristics are improved then the natural/wild steelhead/rainbow trout can extend their range further up into the headwaters. This is the essence of restoring the reach of the West Fork of Little Bear Creek that flows through the City of Troy, ID.

Restoring natural/wild steelhead/rainbow trout to the upper reaches of the West Fork of Little Bear Creek can only be accomplished through the biophysical restoration of those reaches of the West Fork of Little Bear Creek that have been urbanized.

This goal is in concert with the 1994 Fish and Wildlife Program and recommendations of the Columbia River Inter-Tribal Fish Commission (CRITFC) and the Columbia Basin Fish and Wildlife Authority (CBFWA) contained within the document. Of the five habitat objectives recommended by the CRITFC the second includes "...improve degraded habitat; increase habitat quantity by improving access to areas within historic range." This project along the West Fork of Little Bear Creek will not only improve degraded habitat, but will improve access to areas within the historic range of steelhead.

d. Project history

This is a new project.

e. Methods.

The scope of the project includes design, engineering, and construction of a biophysical restoration of a few kilometer urbanized reach of the West Fork of Little Bear Creek that flows through the City of Troy, ID between Idaho State Highway 8 and Idaho State Highway 99.

The scope of the project includes design, engineering, and construction of a biophysical restoration of a few kilometer urbanized reach of the West Fork of Little Bear Creek that flows through the City of Troy, ID between Idaho State Highway 8 and Idaho State Highway 99.

The design methodology used will adhere to Rosgen's River Restoration Principles (Rosgen, 1996) by more completely answering the following questions prior to implementation.

What are the observed problems? Existing information is currently inadequate to completely characterize the problem so Rosgen level III and level IV stream inventories will be used to quantitatively indicate departures from natural state. These techniques will help to more completely describe the problems of the reaches in question for restoration.

What caused the problem? Current and historical land uses are almost always the cause of the problem, but how have they affected the quantity or timing of streamflows and the amount and distribution of energy.

What stream type should this be? In other words what is the future potential of the stream as conditioned by the watershed and valley features? Applications of Rosgen's evolutionary stages of stream types will be used to determine the appropriate stream type.

What is the probable stable form of the stream type under the present hydrology and sediment regime? The stable dimension, pattern, and profile for the identified stream types need to be established. Once the bankfull width has been selected then the following variables can be determined to meet the project objectives: the meander length, the meander radius of curvature, the belt width, the sinuosity, the slope, and the spacing of pools.

Once all of these variables are determined, then design cross sections and flood flows that exceed the bankful discharge will be entered into a HEC-2 model to determine the limits of the flood prone area. The width of the floodplain will be adjusted to convey the 100 year flood if at all possible in the confines of urbanized Troy. The hydraulic modeling and final grading plan will be generated by a local engineering firm under contract with PCEI.

Following the physical channel design appropriate habitat structures will be selected based on Rosgen's Fish Habitat Improvement Structures - Suitability to Stream Types (1996). These will be incorporated in areas where bank stability is of greatest concern.

The final "engineered" design will then be incorporated into the appropriate federal, state, and local permits including but not limited to: US Army Corps of Engineers Section 404 Permit, Idaho Division of Environmental Quality 401 Certification, Idaho Department of Water Resources Alter-A-Stream Channel Permit, City of Troy Development Permit, US Environmental Protection Agency NPDES General Permit for Construction Activities, and the Federal Emergency Management Agency Floodway Map Revision.

Agencies not included in the permitting process will be asked to review the plans as well to insure that they are technically sound and meet objectives of those agencies.

Once the project has approval from all relevant agencies, the earthmoving portion of the project will go out to bid for construction. The contractor will be required to submit an erosion and sediment control plan to PCEI under the auspices of US EPA's NPDES General Permit for Construction Activities, which will then be sent out for review by appropriate agencies. Once the plan is approved then PCEI will issue a notice to proceed.

After excavation is complete, then PCEI will install all habitat structures and bank stability measures. PCEI will then have the site hydroseeded under contract. PCEI will install geotextile fabrics along streambanks to stabilize them until the herbaceous vegetation is able to take over. The majority of the woody vegetation will be planted during the spring following the construction of the new channel alignment and floodplain.

The project will be monitored by PCEI, Idaho DEQ, and Idaho Fish and Game to determine the status of beneficial uses of the stream and the performance of the restoration project. PCEI will focus on monitoring the physical geomorphic characteristics of the stream with Rosgen's Level III and Level IV stream assessments . Idaho DEQ will use its Beneficial Use Reconnaissance Project process to asses the status of beneficial uses and instream water quality and Idaho Fish and Game will continue to monitor fish populations and habitat characteristics throughout the entire Potlatch River Basin.

Sedimentation of the West Fork of Little Bear Creek caused by upland land use practices may be the greatest limiting factor to the success of this project. If the hydraulics of the stream are changed back to a more natural regime and the sediment load capacity of the stream is not exceeded along this reach, then the channel will maintain itself and continue to remove excess habitat degrading sediment.

f. Facilities and equipment.

All excavation equipment will be provided and operated under contract. The following equipment will be used by contractor's during construction of the restoration project: Scraper, Trackhoe, Bulldozer, Grader, and Backhoe.

g. References.

US Department of Housing and Urban Development (1979) Floodway Flood Boundary and Floodway Map, City of Troy, Idaho Latah County.

US Department of Housing and Urban Development (1979) FIRM Flood Insurance Rate Map, City of Troy, Idaho Latah County.

US Department of Housing and Urban Development (1979) Flood Insurance Study, City of Troy, Idaho Latah County.

Schriever, Ed and Doug Nelson (1997) Potlatch River Basin Fisheries Inventory, Latah, Clearwater and Nez Perce Counties, Idaho. Idaho Department of Fish and Game, unpublished report.

US Department of Agriculture SCS (1994) Preliminary Investigation Potlatch River Latah, Clearwater, and Nez Perce Counties, Idaho. Latah Soil and Water Conservation District.

Rosgen, Dave (1996) Applied River Morphology. Wildland Hydrology.

NPPC (1994) The 1994 Columbia River Basin Fish and Wildlife Program 14-Dec-1994 (Posted October 28, 1996 on NPPC Website)

US Army Corps of Engineers, Hydrologic Engineering Center. HEC 2 Water Surface Profiles, Generalized Computer Program Version 4.6.2, Davis California

Section 8. Relationships to other projects

Section 9. Key personnel

Principal Investigator:

Thomas C. Lamar, Executive Director, Palouse-Clearwater Environmental Institute. Responsible for project completion. Oversees Project Manager. 20% FTE for this project. Twelve years experience of staff management and organization. Twelve years experience managing grants from Federal,

State, County, City, Private and Public Foundations. Initiated PCEI's Watershed Program in 1990.

Project Manager:

Adam R. Thornbrough, Watershed Program Coordinator, Palouse-Clearwater Environmental Institute. Coordinates project from beginning through completion. 100% FTE for this project. Seven years experience with watershed restoration activities. Successfully managed five separate stream restoration contracts with the Idaho Division of Environmental Quality.

ADAM R. THORBROUGH
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Education: Washington State University, Pullman, Washington
MS, Environmental Science, 1997

St. Lawrence University, Canton, NY
BS Environmental Geology

Work Experience: Watersheds Program Coordinator, Palouse-Clearwater Environmental Institute (1991-Present)
Coordinates all watershed restoration activities; Oversees contracts; Supervises contractors, interns, and volunteers; Develops policy recommendations.

Publications: Peter L. Vaughn and Adam Thornbrough (1995) Paradise Creek 1996 Flood Tests Stream Bank Stabilization Techniques. Proceedings of 1997 International Erosion Control Association.

Rabe, Fred W. et al (1994) Habitat Assessment and Bioassessment of Paradise Creek and the South Fork of

the Palouse River at Selected Sites in Iadho and Washington: 1992-1993.

Thornbrough, Adam R (1996) Paradise Creek Restoration Project Survives a 50-Year Flood. Land and Water, November/December 1996 P. 42.

Thornbrough, Adam R. (1997) Flood Tests Stream Bank Stabilization Techniques. Land and Water May/June 1997 Vol. 41 no 3 P. 32.

Interests: Running, Skiiing, Bicycling

References: Available upon request

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EDUCATION

Washington State University, Pullman Washington
M.S., Environmental Science, 1985

University of Delaware, Newark, Delaware
B.S., Biology/Anthropology, 1982

WORK EXPERIENCE

Executive Director, Palouse-Clearwater Environmental Institute
Moscow, Idaho (1990-Present)
Directed this grassroots, environmental clearinghouse through membership development, budget growth and staff recruitment. Raised money through community fundraising and grantwriting efforts. Built community confidence and respect for the organization throughout inland northwest region.

Campaign Coordinator, Northwest Coalition for Alternatives to Pesticides
Moscow, Idaho (1988-1990)

Organizer/Kansas State Director, Neighbor to Neighbor
Wichita, Kansas (1987-1988)

Office Manager, Coalition for Central America
Moscow, Idaho (1986-1987, 1988)

Research Assistant, Department of Anthropology, Washington State University
Pullman, Washington (1984-1985)

Resource Librarian, Holland Library, Washington State University
Pullman, Washington (1984)

Research Assistant, Environmental Science Program, Washington State University, Pullman, Washington (1983)

Teaching Assistant, Department of Chemistry, Washington State University
Pullman, Washington (1982-1983)

PUBLICATIONS

Lamar, Thomas C. 1985. *Medicinal Plant Use Among the Shipibo Indians of the Peruvian Montaña.* Washington State University, Pullman, WA.

Lamar, Tom and Dawn Lamp, eds. 1990. *From Victim to Victor: A Citizen's Guide for Responding to Pesticide Exposure Incidents.* Northwest Coalition for Alternatives to Pesticides, Eugene, OR.

Lamar, Tom, ed. 1990. *Getting to the Roots of Pesticide Reform: A Citizen's Guide to Community Organizing.* Northwest Coalition for Alternatives to Pesticides, Eugene, OR

INTERESTS Organic gardening, parenting, traveling, hiking, cooking, swimming, and biking.

REFERENCES Available upon request

Section 10. Information/technology transfer